4/29/60

Sections between [ ] read over phone to Secy of Wm. Laurence of N Y Times for background for Laurence intro of Feynman at 1960 award (To Szilard)

News Bureau
CALIFORNIA INSTITUTE OF TECHNOLOGY
Pasadena, California
SY. 6-7121 Ext. 204 RY. 1-7171

FOR RELEASE SUNDAY, MARCH 14, 1954

Pasadena, California--Selection of Dr. Richard P. Feynman, 35-year-old professor of theoretical physics at the California Institute of Technology, as winner of the Albert Einstein Award--consisting of a $15,000 cash prize and a gold medal--was announced today at Princeton, N.J., by Dr. J. Robert Oppenheimer, director of the Institute for Advanced Study.

The award, reported to be the highest of its kind in the nation, is made every three years for an outstanding contribution to knowledge in the mathematical and physical sciences. It was established March 14, 1949, on the 70th birthday of Albert Einstein and first was awarded in 1951 to Professors Kurt Godel of the Institute for Advanced Study and Julian Schwinger of Harvard University.

This year's award goes to Professor Feynman alone. Selection of the winner is made by a committee of the Institute for Advanced Study, which administers the award.

Professor Feynman is considered one of the world's outstanding young theoretical physicists. He is perhaps best known for his quantum theory of electricity and magnetism, which resolved the difficulties and inaccuracies inherent in early theories of quantum electrodynamics dealing with interactions of atoms with radiation fields. In the past year or so he has been working on a theory of liquid helium.

Feynman was notified of his selection for the award by Lewis Strauss, chairman of the Board of Trustees of the Institute for Advanced Study and chairman of the U.S. Atomic Energy Commission. The award was established by Mr. Strauss in memory of his parents.

Classical physics is based on Newton's laws of motion, Maxwell's equations

--more--

of electricity and magnetism and Einstein's special theory of relativity. Beginning in the early 1900's, the first two were found not to work for events inside the atom: Experimental results were in complete disagreement with them.

The situation remained so until the middle 1920's when Werner Heisenberg and Erwin Schroedinger developed quantum mechanics, which modified Newton's laws so that the mechanical behavior of electrons is correctly described by them.

But Maxwell's equations of electricity and magnetism also needed modification, and several physicists developed a quantum electrodynamics in the next few years. This early theory seemed to apply correctly to a first approximation, but if taken literally it gave entirely wrong answers in problems of atomic interactions.

This was the situation until about 1948, when Feynman and Schwinger independently began to publish their quantum theories of electrodynamics. They varied somewhat in their approach but both methods provided the same answers. The major difference between the two theories was that Schwinger used more of a mathematical approach and Feynman a physical one.

Feynman, for instance, suggested the use of diagrams representing interactions between electrons and light which simplified the analysis of problems and the setting up of equations to solve problems. These have come to be known as Feynman diagrams and now are widely used.

Feynman had begun studying the quantum electrodynamics problem as a graduate student with Professor J.A. Wheeler at Princeton University in about 1941. He wrote his doctoral thesis on a phase of the problem and was awarded the Ph. D. degree in 1942.

Then he had to drop the problem except in scattered moments because he was taken into the Manhattan District (atomic bomb project). Early in the war he worked at Princeton on the problem of separating fissionable uranium 235 from

uranium 238. He was transferred to Los Alamos at its inception and remained there as a theoretical physicist throughout World War II. He saw the first test explosion at Alamagordo in July, 1945.

He was able to work on his quantum electrodynamics only in his leisure time, on buses, at home, etc. However, he could not work on it long enough or consistently enough to make progress.

In the fall of 1945, Feynman became associate professor of theoretical physics at Cornell University and subsequently was deep in the problem of quantum electrodynamics. He approached it from almost every conceivable angle. Then, in 1947, Lamb and Rutherford of Columbia University measured the energy levels of the hydrogen atom so accurately that the existing quantum electrodynamics fell down completely.

Feynman increased his efforts, and when Professor Hans Bethe of Cornell said not long afterward in a Cornell seminar that it probably would prove fruitful if the problem could be attacked in a certain way, Feynman said it could be because this was one of the approaches he had used. It developed that this was indeed the case, Feynman began refining and formalizing his theory and started publishing it in 1948.

His current work concerns liquid helium. Below minus 455 degrees Fahrenheit, liquid helium flows without resistance through pipes. In certain cases, shining a light on it causes it to spout up like a fountain. Feynman is now developing a theory to explain such strange phenomena and others which occur at very low temperatures.

The young theoretical physicist is a native of New York, where he was born May 11, 1918. He attended public schools in that city, graduated from Far Rockaway (N.Y.) High School in 1935, and went to the Massachusetts Institute of Technology, which awarded him the bachelor of science degree in 1939. Three years later,

--more--

including two as a Procter Fellow and one as a research assistant, he had earned the Ph. D. at Princeton. In the summer of 1941 he served as a research physicist at Frankford Arsenal, Philadelphia, on anti-aircraft directors.

He came to Caltech in 1950 as professor of theoretical physics after five years on the Cornell faculty.

He is a member of the American Physical Society and the American Association for the Advancement of Science. He speaks Spanish and Portuguese and has visited Brazil three times, once under the auspices of the U.S. Department of State, to lecture at the Brazilian Center for Physical Research and the University of Brazil. Last September he was a delegate to the International Physics Conference in Tokyo.

He is married to the former Mary Louise Bell of Boise, Idaho. They live at 844 Alameda, Altadena.

The Einstein Award medal, designed by Gilroy Roberts, Philadelphia sculptor and engraver, bears a likeness of Einstein on one side and the legend "Awarded to ----- for Achievement in the Natural Sciences" on the other.

#

Einstein Award

April 20

Frank Bellow - writes

Miss Marjorie Jack of Fortune Magazine called to ask if the following statement would be correct:

" Dr. R. P. Feynman recently won the coveted Einstein award for his work on quantum electrodynamics, ~~and a theory~~ of liquid helium. "

Her point was that the second was still new and perhaps controversial, and she wondered how much the committee had taken it into account.

Apr. 21
Consulted Prof. Pais, who said it would be correct to say that the prize was given for the work on ~~it~~ quantum electrodynamics, but the liquid helium theory was still in progress, and should not be included as reason for the prize. Called Miss Jack and told her this.

VH

14 March 1954

A selection committee at the Institute for Advanced Study announced today on the seventy-fifth birthday of Professor Albert Einstein that the Einstein Award would be given this year to Dr. Richard Phillips Feynman of the California Institute of Technology. This award, established in 1950 by the Lewis and Rosa Strauss Memorial Fund, consists of a gold medal and fifteen thousand dollars. Previous medalists have been Dr. Julian S. Schwinger of Harvard and Dr. Kurt Gödel of the Institute for Advanced Study.

Dr. Feynman, a graduate of the Massachusetts Institute of Technology, received his degree of Doctor of Philosophy from Princeton University in 1942. He was professor of physics at Cornell University from 1945 to 1948. The main area of his research is quantum mechanics and, particularly, quantum electrodynamics. Both among the results and among the concepts in the latter area, some of the most important ones developed in the last decade are due to him. In this respect, his treatment of quantum mechanics by the probability amplitude method, and the development of what is known as the Feynman diagram in accounting for possible particle transformations, are especially noteworthy.

Cal. Tech. New room called 5:30 p.m. 3/11/54 on rumor that Feynman was getting the Einsteim Prize. I referred the call to Dan Coyle.

Dan will coordinate Princeton/Cal Tech release. He had three questi ons:

What is the citation, if any.

How is it going to be awarded. (by check, by mail, etc.?)

Who is the committee of selection

KR

Citation is contained in press release, in which reference to the work of Feynman is made.

Awarded by check by mail through Lewis Strauss, presumably with medal.

Committee of selection: Einstein, Oppnehimer, von Neumann and Weyl.

for release Sunday papers, March 14, 1954

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON

OFFICE OF THE CHAIRMAN

5 March 1954

Dear Robert:

I have just had a short talk with Dr. von Neumann and we made a small change in the text of the proposed statement to be made on Einstein's birthday in connection with the award to Feynman. I am enclosing a clean copy. I understand from Johnnie that this is in form generally acceptable to you and, that being the case, you will see that it reaches the hands of the press on Einstein's birthday.

Sincerely yours,

Lewis L. Strauss

Dr. J. Robert Oppenheimer
The Institute for Advanced Study
Princeton, New Jersey

encl.

2 November 1953

Dear Lewis:

Thank you for your note.

Though a few other names have been mentioned casually, it appears that Einstein, von Neumann and Weyl have pretty well fixed on Feynman as the proper recipient of the Einstein Award; and I am naturally pleased with this choice.

This is not a final nor a formal recommendation to you, but a progress report. Should you want to look more fully into Feynman, we are sending you a partial bibliography.

With every good wish,

Robert Oppenheimer

Lewis L. Strauss, Esq.
Chairman, U. S. Atomic Energy
Commission
Washington 25, D. C.

enclosures

Name: Richard P(hillips) FEYNMAN

Position: Professor of Theoretical Physics

Address: California Institute of Technology, Pasadena, California

Born May 11, 1918 in New York, New York. B. S., Massachusetts Institute of Technology, 1939; Ph.D., Princeton University, 1942. Member Los Alamos Scientific Laboratory, 1942-45; Assistant and Associate Professor of Theoretical Physics, Cornell University, 1945-50; Professor of Theoretical Physics, California Institute of Technology, 1950- . Visiting Professor of Theoretical Physics, University of Brasil, 1951-52.

Professor Feynman's major contribution to science has been in the field of quantum electrodynamics. This work, the origins of which can be traced to his doctoral dissertation, affords an invariant method of calculating observable quantities involved in the interaction of matter and radiation fields in such a way as to avoid the divergencies inherent in the traditional Hamiltonian formulation of quantum mechanics. Feynman's contributions, together with the theories of J. Schwinger and S. Tomonaga, to which it is in part equivalent and in part complementary, form the basis of our present understanding of the nature of quantum fields. During the war, while at Los Alamos, Feynman was a member of the theoretical division of that laboratory and worked on a number of different topics related to the development of the atomic bomb. Most of this work has not been published.

PRINCIPAL CONTRIBUTIONS TO SCIENCE
BY RICHARD P. FEYNMAN

Forces in molecules. Phys. Rev. 56: 340-343, 1939.

Interaction with the absorber as the mechanism of radiation. (With J. A. Wheeler.) Rev. Mod. Phys. 17: 157, 1945.

Space-time approach to non-relativistic quantum mechanics. Rev. Mod. Phys. 20: 367, 1948.

A relativistic cut-off for classical electrodynamics. Phys. Rev. 74: 939-946, 1948.

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The theory of Positrons. Phys. Rev. 76: 749-759, 1949.

Space-Time Approach to Quantum Electrodynamics. Phys. Rev. 76: 769-789, 1949.

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Atomic Theory of Liquid Helium Near Absolute Zero. Phys. Rev. 91: 1301-1308, 1953.

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON

OFFICE OF THE CHAIRMAN

30 October 1953

Dear Robert:

With reference to your memorandum to Professors Einstein, von Neumann and Weyl, I think it is timely that you have raised the question of suitable candidates for the Einstein Award. Will you let me know what other persons are under consideration.

Faithfully yours,

Lewis

Lewis L. Strauss

Dr. J. Robert Oppenheimer
The Institute for Advanced Study
Princeton, New Jersey

27 Bergstrasse, Zurich, Switzerland, October 18, 1953.

Einstein
& Neumann

Please return to
Director's Office.

Professor Robert Oppenheimer
Director of the Institute for Advanced Study
Princeton, New Jersey
U. S. A.

Dear Robert:

It is a little difficult for me to answer the question of your memorandum on the Einstein Award, ~~as~~ since I have completely forgotten the rules of the game. Which are the fields of research for which it is given? Is the recipient supposed to be a citizen or at least a resident of the US? I seem to remember that, when we were discussing the first award, I looked into the papers of Schwinger, Feynman and Onsager. Was it not given then to Gödel and Schwinger? Are there always two prize winners at the same time?

I think it proper that one award should go to one working in Einstein's own field: theoretical physics, and so I am for Feynman in the first place. I am unable to judge Martin Deutsch's work.

In mathematics the name of a young Harvard man, Andrew M. Gleason, is now on everybody's lips. Deane Montgomery could tell you about him. But if one of the prizes should again go to a mathematician (which I doubt, it should), I would prefer Shiing-shen Chern in Chicago. He has done very outstanding work in global differential geometry and is probably the leading man in that field now. What makes me think of him is, besides his mathematical eminence, also his close connection with the Institute. The first papers in which he showed his mettle were written during his early years at the Institute, while later, after the Chinese Mainland had fallen under Mao's rule, we were instrumental in bringing him back to the States.

But these are only preliminary suggestions. I hope, you can spare a minute to remind me of our duties and their limitations before I cast a vote!

I noticed that the $ 10,000 which the Academia Sinica had advanced me in 1947 have now been returned to the Taipeh branch of the Academy.

With warm greetings to you and Kitty from Ellen and

your (sometimes homesick)

Hermann W.

Hermann Weyl

Name: Richard P(hillips) FEYNMAN

Position: Professor of Theoretical Physics

Address: California Institute of Technology, Pasadena, California

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Physics

DATA REQUIRED FOR NEW PROPOSALS FOR NOMINATION

MF

Name Richard P(hillips) Feynman

Position Professor of Theoretical Physics

Address California Institute of Technology, Pasadena, California

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The theory of positrons. Phys. Rev. 76: 749, 1949.

Space-time approach to quantum electrodynamics. Phys. Rev. 76: 769, 1949.

Equations of state or elements based on the generalized Fermi-Thomas theory. (With N. Metropolis and E. Teller.) Phys. Rev. 75: 1561-1573, 1949.

Mathematical formulation of the quantum theory of electromagnetic inter-action. Phys. Rev. 80: 440-457, 1950.

An operator calculus having application in quantum electrodynamics. Phys. Rev. 84: 108-128, 1951.

Radiative corrections to compton scattering. (With L. M. Brown.) Phys. Rev. 85: 231-244, 1952.

Einstein Preis 1954

15 October 1953

Dear Professor Einstein:

Listed below are the references about which we spoke this morning:

Deutsch, Martin -- The Physical Review, Vol. 82, p. 455: "Evidence for the Formation of Positronium in Gases" (L)
The Physical Review, Vol. 83, p. 866: "Three-Quantam Decay of Positronium" (L)
The Physical Review, Vol. 84, p. 601: "Short Range Interaction of Electrons and Fine Structure of Positronium" (L)
The Physical Review, Vol. 85, p. 1047: "Zeeman Effect and Hyperfine Splitting of Positronium" (L)

Feynman, R. P. -- In addition to the off-prints, "Theory of Positrons" and "Space-Time Approach to Quantam Electrodynamics," there are the following:

The Physical Review, Vol. 84, p. 108: "Operator Calculus having Application in Quantam Electrodynamics"
The Physical Review, Vol. 90, p. 1116: "The λ-Transition in Liquid Helium" (L)
The Physical Review, Vol. 91, p. 1291: "Atomic Theory of the λ Transition in Helium"

For Onsager, I am enclosing four papers:

"Statistical Hydrodynamics"
"Transition Points" - by Onsager & Kaufman
"Crystal Statistics. III. Short-Range Order in a Binary Ising Lattice" - by Onsager & Kaufman
"Crystal Statistics. I. A Two-dimensional Model with an Order-Disorder Transition"

I shall appreciate it very much if I may have these off-prints back when you have finished with them.

Robert Oppenheimer

6 October 1953

Memorandum

To: Professors Einstein, von Neumann and Weyl

Do you have any thoughts ~~for~~ of suitable candidates for the Einstein Award? If we should have a good recommendation, it would, I think, be possible to make an award next March. From physics, it would seem to me that we might consider Martin Deutsch, Feynman, and possibly Onsager. What are your views?

Robert Oppenheimer

cc: Mr. Lewis L. Strauss